



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,108	09/18/2002	Ronald Scott Bunker	839-1331	8204
30024	7590	10/01/2003	EXAMINER	
NIXON & VANDERHYE P.C./G.E. 1100 N. GLEBE RD. SUITE 800 ARLINGTON, VA 22201			KIM, TAE JUN	
			ART UNIT	PAPER NUMBER
			3746	

DATE MAILED: 10/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

NK

<b>Office Action Summary</b>	<b>Application No.</b> 10/065,108	<b>Applicant(s)</b> BUNKER, RONALD SCOTT	
	<b>Examiner</b> Ted Kim	<b>Art Unit</b> 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 August 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9, 11-17 and 22-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-17 and 22-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>7</u> . | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4-9, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ritter et al (5,724,816) in view of JP 2001-164901 and optionally Glezer et al (6,098,397). Ritter et al teach a connector segment 40 for connecting a combustor liner and transition piece in a gas turbine, comprising a substantially cylindrical shape body of double-walled construction including inner and outer walls 56, 42, respectively and a plurality of cooling channels 46 extending axially along the segment, between said inner and outer walls 56, 42. Ritter et al do not teach at least one of said radially inner and outer surfaces is formed with an array of semispherical concavities arranged in staggered rows. Ritter et al do teach the passages are not limited to simple axial passages but more complicated enhanced cooling geometries can be formed such as by machining on surfaces including the inner wall (col. 4, lines 37-40). JP 2001-164901 teach employing concavities (Fig. 5, 6) on turbine component surfaces in the same region as Ritter et al (see page 14, 31) in order to enhance the cooling effectiveness and there is no restriction on what surfaces have the concavities. Glezer et al teach using concavities 84 or 84' arranged in staggered rows on turbine component surfaces

in order to enhance the cooling effectiveness. Ranges are disclosed on col. 4, lines 45 and following, these include spacing between adjacent concavities as well as the depth ratio within the claimed range. As for the other ranges, these are believed to be an obvious matter of finding the workable ranges in the art. In fact, JP '901 teaches the concavity diameter  $d$  is on the order of 125 to 4000 microns (0.004921 to 0.15748 inches), see e.g. page 27. Ritter et al '816 teach the height of the passages is 0.03 inches (col. 5, line 1) or 0.04 inches high/deep (col. 6, line 52). Using these dimensions would give a height to diameter ratio for the 0.03 inch high passages a range of 0.1905-6.1 and for the 0.04 inch high passages a range of 0.154-8.13. Consequently, applicant's claimed ranges of 0.25-5 and 0.5-1, are clearly within the exemplary ranges known in the prior art and would have been obvious to use without undue experimentation. Hence, it would have been obvious to employ the claimed ranges, as an obvious matter of finding the workable ranges in the art. It would have been obvious to one of ordinary skill in the art to employ the surface concavities on either or both the inner and outer walls of Ritter et al, in order to enhance the cooling of these passages, as taught by JP '901 and optionally Glezer et al.

3. Claims 1-9, 11-17, 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ritter et al (5,822,816) in view of JP 2001-164901 and optionally Glezer et al (6,098,397), as applied above and further in view of Ritter et al (5,724,816). Ritter '816 teaches various aspects of the claimed invention but does not teach using a plurality of axially spaced cooling holes in the outer wall. Ritter et al '853 (which incorporates Ritter '816 by reference on col. 1, lines 5-10) teach a connector segment 52 for connecting a

combustor liner and transition piece in a gas turbine, comprising a substantially cylindrical shape body of double-walled construction including inner and outer walls 56, 54, respectively and a plurality of cooling channels 60 extending axially along the segment, between said inner and outer walls 56, 54 with a plurality of axial spaced impingement holes 62 in the outer wall. It would have been obvious to one of ordinary skill in the art to employ a plurality of axially spaced cooling holes in the outer wall, as taught by Ritter '853, in order to facilitate impingement cooling.

4. Claims 1-9, 11-17, 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ritter et al (5,822,853) in view of JP 2001-164901 and optionally Glezer et al (6,098,397). Ritter et al '853 teach a connector segment 52 for connecting a combustor liner and transition piece in a gas turbine, comprising a substantially cylindrical shape body of double-walled construction including inner and outer walls 56, 54, respectively and a plurality of cooling channels 60 extending axially along the segment, between said inner and outer walls 56, 54 with a plurality of axial spaced impingement holes 62. Ritter et al do not teach at least one of said radially inner and outer surfaces is formed with an array of semispherical concavities arranged in staggered rows. Ritter et al do teach the passages are not limited to simple axial passages but further enhancements for the convective heat transfer could be employed including roughness elements or other means (col. 7, lines 18-25). JP 2001-164901 teach employing concavities (Fig. 5, 6) on turbine component surfaces in the same region as Ritter et al (see page 14, 31) in order to enhance the cooling effectiveness and there is no restriction on what surfaces have the concavities. Glezer et al

teach using concavities 84 or 84' arranged in staggered rows on turbine component surfaces in order to enhance the cooling effectiveness. Ranges are disclosed on col. 4, lines 45 and following, these include spacing between adjacent concavities as well as the depth ratio within the claimed range. As for the other ranges, these are believed to be an obvious matter of finding the workable ranges in the art. In fact, JP '901 teaches the concavity diameter  $d$  is on the order of 125 to 4000 microns (0.004921 to 0.15748 inches), see e.g. page 27. Ritter et al (5,724,816, which is incorporated by reference on col. 1, lines 5-10) teach the height of the passages is 0.03 inches (col. 5, line 1) or 0.04 inches high/deep (col. 6, line 52). Using these dimensions would give a height to diameter ratio for the 0.03 inch high passages a range of 0.1905-6.1 and for the 0.04 inch high passages a range of 0.154-8.13. Consequently, applicant's claimed ranges of 0.25-5 and 0.5-1, are clearly within the exemplary ranges known in the prior art and would have been obvious to use without undue experimentation. Hence, it would have been obvious to employ the claimed ranges, as an obvious matter of finding the workable ranges in the art. It would have been obvious to one of ordinary skill in the art to employ the surface concavities on either or both the inner and outer walls of Ritter et al, in order to enhance the cooling of these passages, as taught by JP '901 and optionally Glezer et al.

### ***Response to Arguments***

5. Applicant's arguments filed 8/22/03 have been fully considered but they are not persuasive. Applicant argues that Ritter '816 is not clear as to where the piece 40, 42 is upstream or downstream of the transition piece 38. Applicant has identified that the

construction is toward “combustors or combustor sections and transition pieces”. Clearly the second alternative incorporates both the combustor section and transition piece being of construction 40, 42. Consequently, any arbitrary connector segment between the combustor and the transition piece reads on the claimed connector segment as all the pieces from the combustor – connector segments – transition piece are constructed by the same construction of 40, 42. Alternately, in response to applicant's arguments, the recitation for connecting a combustor liner and a transition piece in a gas turbine does not have to be given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Applicant's arguments regarding JP '901 are not persuasive. Applicant argues that the range is limited to 180 to 600 microns – ignoring the explicit teachings on page 27 of 125 to 4000 microns, which are referenced to Figure 5. Moreover, the process of formation of the concavities is irrelevant as it results in the claimed structure. Even if given weight, JP '901 clearly teaches the concavities may be made directly during the casting procedure (page 28, 3<sup>rd</sup> paragraph). Lastly, the formation of eddies will inherently occur as the same structure is also produce, i.e. concavities in the flow surface. As applicant has expressly ignored select teachings of the JP '901 reference, including the disclosed ranges for the

diameter of the concavities, it is clear that the combination of references fairly teaches the claimed invention.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

#### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 703-308-2631. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 703-872-9302 for Regular faxes and 703-872-9303 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached on 703-308-0102.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861.

General inquiries can also be directed to Technology Center Customer Service Office at 703-306-5648 or the Patents Assistance Center whose telephone number is 800-786-9199.

Furthermore, a variety of online resources are available at

<http://www.uspto.gov/main/patents.htm>

  
\_\_\_\_\_

Ted Kim	Telephone	703-308-2631
Primary Examiner	Fax (Regular)	703-872-9302
September 29, 2003	Fax (After Final)	703-872-9303
Technology Center 3700 Receptionist	Telephone	703-308-0861
Technology Center 3700 Customer Service	Telephone	703-306-5648
Patents Assistance Center	Telephone	800-786-9199